IN THE SPECIFICATION:

Please add the following text to the specification, beginning at page 1, line 1:

-- Application Serial No. 09/231,854, filed January 14, 1999, and Application Serial No. 09/494,213, filed January 14, 2000, are copending applications which each reissues of Application Serial No. 08/490,342, filed June 14, 1995, now U.S. Patent No. 5,592,939.--

C1

IN THE CLAIMS:

Please cancel claims 1, 3, 7, 8, 10, 15-26, 28, 32, 33, 35 and 40-47 without prejudice, and amend claims 2, 4, 9, 11-13, 27, 29, 34, and 36-38 as follows: (All claims are shown for the convenience of the Examiner)

1. (Canceled)

2. (Amended) The method as recited in claim [1]4, wherein the step of inducing said set of orientation signal values comprises the steps of:

C2

generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by a principal magnetic component in one axial dimension and relatively smaller magnetic components in two other axial dimensions.

3. (Canceled)

4. (Amended) [The method as recited in claim 3, wherein said generating step further includes the steps of:]A method of determining the location of a magnetically-sensitive, electrically conductive sensing coil affixed to a distal end of a catheter probe partially inserted into a body cavity within a navigational domain, comprising the steps of:

C3

inducing within said sensing coil a set of orientation signal values each representative of an orientation of said sensing coil and independent of a position of said sensing coil;

determining the orientation of said sensing coil using said induced orientation signal values;

inducing within said sensing coil a set of positional signal values each representative of the position of said sensing coil by generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by two principal gradient magnetic components in respective axial dimensions and a relatively smaller magnetic components in a third axial dimension;

generating said fields to provide a plurality of constant signal surfaces for the sensing coil such that an intersection between two such surfaces with components in the same axial dimensions produces a line along which said sensing coil is located;

wherein said two such surfaces are identified from among said plurality of constant signal surfaces by their ability to induce one of said positional signal values; and,

determining the position of said sensing coil using said positional signal values and said determined orientation.

5. The method as recited in claim 4, further comprises the steps of:

weighting each line in accordance with a signal strength of said corresponding constant signal surface; and

determining an intersection of said weighted lines.

6. The method as recited in claim 5, wherein six constant signal surfaces are generated to produce three intersection lines.

7. (Canceled)

8. (Canceled)

9. (Amended) The system as recited in claim [8]11, wherein [the first signal-inducing means comprises:

field generation means for successively generating]each of the magnetic field patterns projected into said navigational domain[, each] is characterized substantially by a principal magnetic field component in one direction and relatively smaller magnetic components in two other directions.

C4

10. (Canceled)

11. (Amended) [The system as recited in claim 10, wherein said magnetic coils are] A system for determining the location of a magnetically-sensitive, electrically conductive sensing coil affixed to a distal end of a catheter probe partially inserted into a body cavity within a navigational domain, comprising:

C5

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils disposed in a planar top of an examination deck upon which a patient is disposed during a surgical procedure;

analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

12. (Amended) [The system as recited in claim 10, wherein said magnetic coils are] A system for determining the location of a magnetically-sensitive, electrically conductive sensing coil affixed to a distal end of a catheter probe partially inserted into a body cavity within a navigational domain, comprising:

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils disposed in a planar top and in rail members edge supported by said planar top for an examination deck upon which a patient is disposed during a surgical procedure;

analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

13. (Amended) The system as recited in claim [8]11, wherein the second signal-inducing means comprises:

field generation means for successively generating magnetic field patterns each characterized by a first and second gradient field component in respective directions and a relatively smaller third component in another direction.

14. The system as recited in claim 13, wherein the field generation means comprises a magnetic coil assembly.

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

24 ~~27~~. (Amended) The method as recited in claim ~~29~~ 23, wherein the step of inducing said set of orientation signal values comprises the steps of:

generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by a principal magnetic component in one axial dimension and relatively smaller magnetic components in two other axial dimensions.

28. (Canceled)

23 ~~29~~. (Amended) A method of determining the location of a magnetically-sensitive, electrically conductive sensing coil in a navigational domain within a body, comprising the steps of:

inducing within said sensing coil a set of orientation signal values each representative of an orientation of said sensing coil and independent of a position of said sensing coil;

C1

determining the orientation of said sensing coil using said induced orientation signal values;

inducing within said sensing coil a set of positional signal values each representative of the position of said sensing coil by generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by two principal gradient magnetic components in respective axial dimensions and a relatively smaller magnetic components in a third axial dimension;

generating said fields to provide a plurality of constant signal surfaces for the sensing coil such that an intersection between two such surfaces with components in the same axial dimensions produces a line along which said sensing coil is located;

wherein said two such surfaces are identified from among said plurality of constant signal surfaces by their ability to induce one of said positional signal values; and,

determining the position of said sensing coil using said positional signal values and said determined orientation.

23

25 ~~30~~. The method as recited in claim ~~29~~, further comprises the steps of:

weighting each line in accordance with a signal strength of said corresponding constant signal surface; and

determining an intersection of said weighted lines.

25

26 ~~31~~. The method as recited in claim ~~30~~, wherein six constant signal surfaces are generated to produce three intersection lines.

32. (Canceled)

33. (Canceled)

28 ~~34.~~ (Amended) The system as recited in claim ~~36~~ 27, wherein [the first signal-inducing means comprises:

field generation means for successively generating]each of the magnetic field patterns projected into said navigational domain[, each] is characterized substantially by a principal magnetic field component in one direction and relatively smaller magnetic components in two other directions.

C8

35. (Canceled)

27 36. (Amended) A system for determining the location of a magnetically-sensitive, electrically conductive sensing coil in a navigational domain within a body, comprising:

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils and said magnetic coils are disposed in a planar top of an examination deck upon which a patient is disposed during a surgical procedure;

C9 analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and,

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

31 ~~37~~. (Amended) A system for determining the location of a magnetically-sensitive, electrically conductive sensing coil in a navigational domain within a body, comprising:

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils and said magnetic coils are disposed in a planar top and in rail members edge supported by said planar top for an examination deck upon which a patient is disposed during a surgical procedure;

C9 Cont.

analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and,

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

27

29 ~~38~~. (Amended) The system as recited in claim ~~36~~, wherein the second signal-inducing means comprises:

field generation means for successively generating magnetic field patterns each characterized by a first and second gradient field component in respective directions and a relatively smaller third component in another direction.

29

30 ~~39~~. The system as recited in claim ~~38~~, wherein the field generation means comprises a magnetic coil assembly.

---

40. (Canceled)

41. (Canceled)